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Clinical Article

SUCCESSFUL THERAPEUTIC MANAGEMENT OF IVERMECTIN TOXICOSIS IN A NON-DESCRIPT DOG: A CASE STUDY

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SUMMARY

A 9-year-old, non-descript dog was presented with history of anorexia, salivation, incoordination and apparent blindness after administration of 80 mg Ivermectin bolus orally. The case diagnosed as ivermectin toxicity and treatment given as inj. Atropine sulphate @ 0.04 mg/kg BW IV; inj. Dexamethasone @0.25 mg/kg BW IM, inj. Neurobion 2 ml IV, inj. Dextrose 5% 300 ml IV, inj. Neostigmine sulphate @0.05 mg/kg BW SC and inj. RL 300 ml SC. Improvement in clinical signs started after first day of treatment. Inj. Neostigmine @ 0.05 mg/kg BW was repeated every 8 hours for 2 days. Few drops of CMC eye drop every 5 hours and syrup Silymarine@ 5 ml PO was advised. The dog showed complete recovery after 3 days post treatment.

Keywords: Dog, Ivermectin, Neostigmine, Toxicity

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Ivermectin is one of thesafest broad-spectrum anti-parasitic drug widely used in veterinary medicine. It is a semi-synthetic agent derived from B1a and B1b avermectin components (Sandhu, 2012). Off-label use of the drug in dogs for ectoparasites and endoparasites is common, with dosage recommendations ranging from 50 to 300 µg/kg PO or subcutaneously. It has a wide margin of safety and its lethal dose 50 (LD_{50}) in dogs is 80 mg/kg (Plumb, 2018). However, toxicity cases are reported in dogs and are mostly because of miss-administration of a product manufactured for large animals (Islam *et al.*, 2017).

A 9-year-old, non-descript, 27 kg weight, intact male dog was presented with the complaint of anorexia, salivation, incoordination, weakness and apparent blindness after administration of 80 mg Ivermectin bolus orally the previous day morning (Fig. 1). Clinical examination revealed hypothermia, dehydration, ataxia, bradycardia, dysponea, pink mucous membrane, mydriasis, negative pupillary light reflex (both direct and consensual), negative menace reflex and acute blindness. The dog had not passed stools and had yellow-coloured urine (Fig. 2). The case was diagnosed as ivermectin toxicosis based on history of administration of high dose of ivermectin and specific clinical signs and symptoms.

Improper dosage administration of drugs has been reported as one of the major causes of drug toxicity in animals. As there is no specific antidote for ivermectin toxicity, symptomatic treatment and supportive therapy were opted (Islam *et al.*, 2017) and the dog was administered inj. Atropine sulphate @0.04 mg/kg BW IV and inj. Dexamethasone @0.25 mg/kg BW IM. Intravenous Dextrose 5% 300 ml with inj. Neurobion was administered slowly over 4 hours. Ringer's lactate 300 ml was administered SC. Inj Neostigmine@0.05 mg/kg BW was administered SC 4 hours after inj. Atropine and thereafter it was repeated every 8 hours for 2 days. Advised to dog's guardians to apply few drops of Carboxymethyl Cellulose Sodium (CMC) eye drop every 5 hours in both eyes and syrup Silymarine @ 5 ml BIDPO till recovery.

The next day, the dog's condition was improved. However, the dog was mildly dehydrated, appetite improved, stools voided and started behaving as if sighted and temperature and heart rate were normal. Incoordination improved, pupillary light reflex and menace reflex were present. Inj. Neostigmine was discontinued and rest same treatment. By the evening of 3rd day, the dog showed complete recovery.

The recommended dosage of Ivermectin for dogs is 0.2 mg/kg of BW. Therefore, the required total dosage in this case was 5.5 mg, but the animal was given 80 mg, which was around 14 times more than recommended dosage.

Islam *et al.* (2017) and Singh (2020) have recorded clinical signs of depression, ataxia, partial blindness, dilated pupil, negative pupillary light reflex, weakness, incoordination and behavioural changes. Dogs affected ivermectin toxicity should receive supportive and symptomatic therapy (Plumb, 2018) as there is no specific antidote for ivermectin toxicity (Islam *et al.*, 2017 and Singh, 2020).

Inj. Atropine sulphate @0.02 mg/kg BW IV was administered to check the bradycardia and Inj. Dexamethasone @0.25 mg/kg BW IM was administered

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Fig. 1. Ivermectin Affected Dog

Fig. 2. Blindness of affected dog

to check the shock-like symptoms.inj. Neostigmine @0.05 mg/kg BW SC as it is an anti-cholinesterase agent that results in the accumulation of increased amounts of acetylcholine (ACh) at the synapse (Plumb, 2018 and Singh, 2020). This increase in ACh increases the conductance of sodium ions into the postsynaptic membrane, causing depolarization to occur thereby reversing the inhibitory effect of GABA on the post-synaptic neuron (Hopper *et al.*, 2002).

In conclusion, ivermectin toxicity in dog occurs due to owner's negligence but it is possible to save the life of affected dog and complete recovery can occur if treatment is given on time and properly though there is no specific antidote of ivermectin toxicity available.

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